AMENDMENTS TO THE CLAIMS

The listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (Currently Amended) An organic contaminant molecule sensor comprising: an electrochemical cell having a solid state oxygen anion conductor, a measurement electrode formed on a first surface of the conductor for exposure to a monitored environment, and a reference electrode formed on a second surface of the conductor for exposure to a reference environment that is not formed by the solid state oxygen anion conductor, the electrodes comprising material for catalysing the dissociative absorption of oxygen; and means for monitoring the potential difference between the electrodes, so that, in the absence of organic contaminant molecules in the monitored environment, the potential difference between the electrodes assumes a base value V_b and, upon the introduction of organic contaminant molecules into the monitored environment, the potential difference assumes a measurement value V_m due to the reaction of the organic contaminant molecules with oxygen in the monitored environment, V_m-V_b being indicative of the amount of organic contaminant molecules introduced into the monitored environment; the sensor further comprising means for controlling the oxygen electrochemical semi-permeability of the cell including means for controlling the concentration of oxygen within the reference environment.

2. (Original) A sensor according to claim 1 comprising means for controlling the temperature of the cell.

3. (Original) A sensor according to claim 2 wherein the control means comprises a heater and a thermocouple arrangement.

4. (Original) A sensor according to claim 1 wherein the material for catalysing the dissociative absorption of oxygen is platinum.

5. (Currently Amended) A sensor according to claim 1 wherein the solid state oxygen anion conductor is selected from the group of materials ~~comprising~~ consisting of gadolinium doped ceria and yttria stabilised zirconia.

6. (Previously Presented) A sensor according to claim 1 wherein the reference oxygen environment is a solid-state source of oxygen selected from the group consisting of a metal/metal oxide couple of Cu/Cu_2O, a metal/metal oxide couple of Pd/PdO and a metal/metal oxide couple of Cu_2O/CuO.

7. (Cancelled)

8. (Previously Presented) A sensor according to claim 1 wherein the oxygen electrochemical semi-permeability control means further comprises an additional electrode in the reference environment and means for controlling the electrical current flowing between the additional electrode and the measurement electrode.

9. (Cancelled)

10. (Cancelled)

11. (Original) A sensor according to claim 1 further comprising means for controlling the amount of oxygen within the monitored environment.

12. (Original) A sensor according to claim 11 further comprising means for controlling the pressure within the monitored environment.

13. (Original) A sensor according to claim 11 further comprising means for drawing a flow of gas into the monitored environment, and means for extracting oxygen from gas being drawn into the monitored environment.

14. (Currently Amended) A method of monitoring the amount of organic contaminant introduced into a monitored environment comprising: (a) providing an electrochemical cell having a solid state oxygen anion conductor, a measurement electrode formed on a first surface of the conductor for exposure to the monitored environment, and a reference electrode formed on a second surface of the conductor for exposure to a reference environment that is not formed by the solid state oxygen anion conductor, the electrodes comprising material for catalysing the dissociative absorption of oxygen; (b)(1) monitoring the potential difference between the electrodes in the absence of organic contaminant molecules in the monitored environment, and (b)(2) monitoring the potential

difference between the electrodes upon the introduction of organic contaminant molecules into the monitored environment where the potential difference in the presence of the organic contaminant molecules is a function of the reaction of the organic contaminant molecules with the oxygen in the monitored environment; so that the difference between (I) the potential difference between the electrodes upon the introduction of organic contaminant molecules and (II) the potential difference between the electrodes in the absence of organic contaminant molecules is a function of the amount of organic contaminant molecules introduced into the monitored environment; and (c) controlling the oxygen electrochemical semi-permeability of the cell by controlling the concentration of oxygen within the reference environment.

15. (Original) A method according to claim 14 further comprising the step of controlling the temperature of the cell.

16. (Cancelled)

17. (Previously Presented) A method according to claim 14 wherein the oxygen electrochemical semi-permeability of the cell is further controlled by controlling the electrical current flowing between the measurement electrode and an additional electrode in the reference environment.

18. (Cancelled)

19. (Cancelled)

20. (Original) A method according to claim 14 further comprising the step of controlling the amount of oxygen within the monitored environment.